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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 10/765,623      | 01/27/2004  | Zvi Yaniv            | 12179-P100D1        | 1353             |

7590

09/22/2005

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| EXAMINER |
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| ART UNIT | PAPER NUMBER |
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2879

DATE MAILED: 09/22/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/765,623

Applicant(s)

YANIV ET AL.

Examiner

Mariceli Santiago

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 01 July 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-9, 11 and 12 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-9, 11 and 12 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 19 July 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### ***Response to Amendment***

The Amendment, filed on July 1, 2005, has been entered and acknowledged by the Examiner.

Cancellation of claims 10 and 13-18 has been entered.

Claims 1-9, 11 and 12 are pending in the instant application.

### ***Examiner's note***

For purpose of the examination of claims 1-9, 11 and 12, the examiner notes that applicant is claiming the product of an apparatus including a method (i.e. a process) of making the substrate with holes "embossed therein with a die", consequently, claims 1-9, 11 and 12 are considered "product-by-process" claims. In spite of the fact that a product-by-process claim may recite only process limitations, it is the product and not the recited process that is covered by the claim. Furthermore, patentability of a claim to a product does not rest merely on the difference in the method by which the product is made. Rather, is the product itself which must be new and not obvious. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process. *In re Thorpe*, 777 F.2d 695, 698, 227 USPQ 964, 966 (Fed. Cir. 1985). Accordingly, the structure implied by the process steps would be considered for assessing the patentability of product-by-process claims over the prior art (see MPEP 2113).

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

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A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claim 1 is rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Park et al. (US 6,019,656).

Regarding claim 1, Park discloses an apparatus comprising a substrate (11) with holes therein, and carbon nanotubes (13) deposited in the empty holes (Fig. 1A-1C).

Claim 1 is rejected under 35 U.S.C. 102(e) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Imai et al. (US 6,653,366).

Regarding claim 1, Imai discloses an apparatus comprising a substrate (11) with holes (12) therein, and carbon nanotubes (13) deposited in the empty holes (Fig. 3A).

Claim 1 is rejected under 35 U.S.C. 102(e) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Nakamoto (U.S. 6,097,138).

Regarding claim 1, Nakamoto discloses an apparatus comprising a substrate (52) with holes therein, and carbon nanotubes (16) deposited in the empty holes (Figs 8A-8C).

Regarding claim 2, Nakamoto discloses an apparatus further comprising a conductive layer (28) within the substrate (52) electrically connecting at least a portion of the carbon nanotubes with a plurality of the holes (Fig. 10).

Regarding claim 3, Nakamoto discloses an apparatus further comprising a gate electrode (54) coextensive with the substrate (52).

Regarding claim 5, Nakamoto discloses an apparatus further comprising an anode (76) positioned a distance from the substrate, having a cathodoluminescent<sup>1</sup> material (78) for emitting photons in response to bombardment from electrons emitted by the carbon nanotubes (Fig. 10).

Regarding claim 6, Nakamoto discloses an apparatus further comprising circuitry for causing the electrons to be emitted by the carbon nanotubes.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 7-9, 11 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yaniv et al (US 6,312,303) in view of Nakamoto (U.S. 6,097,138).

Regarding claims 3, 7-9, 11 and 12, Yaniv discloses a data processing system comprising a processor, a memory device, a storage device, an input device, a display device and a bus system for coupling the processor to the memory device, the storage device, the input device, and a display device. Yaniv discloses the suitability of using a nanotube-based field emission device as the display device component, however, fails to disclose the display device comprising a substrate with holes therein, and carbon nanotubes deposited in the empty holes. Yaniv further discloses the field emission device comprising an anode positioned a distance from the substrate, having a phosphor for emitting photons in response to

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<sup>1</sup> Cathodoluminescence is an optical and electrical phenomenon where a beam of electrons generated by an electron gun (e.g. cathode ray tube) impacts on a phosphor causing it to emit visible light. From <http://www.answers.com/topic/cathodoluminescence>

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bombardment from electrons emitted by the carbon nanotubes, the optional implementation of gate electrodes (509) within the display device and circuitry for causing the electrons to be emitted by the carbon nanotubes. In the same field of endeavor, Nakamoto discloses an apparatus comprising a substrate (52) with holes therein, and carbon nanotubes (16) deposited in the empty holes (Figs 8A-8C), a conductive layer (28) within the substrate (52) electrically connecting at least a portion of the carbon nanotubes with a plurality of the holes (Fig. 10), a gate electrode (54) coextensive with the substrate (52), an anode (76) positioned a distance from the substrate, having a cathodoluminescent material (78) for emitting photons in response to bombardment from electrons emitted by the carbon nanotubes (Fig. 10) and circuitry for causing the electrons to be emitted by the carbon nanotubes. The nanotube's arrangement within the substrate provides for increase high-density nanotubes per unit area thus obtaining excellent luminous efficacy. Accordingly, it would have been obvious at the time the invention was made to a person having ordinary skills in the art to incorporate the nanotube-based display device of Nakamoto in the data processing system of Yaniv in order to provide a display device with increase high density nanotubes per unit area thus obtaining excellent luminous efficacy.

### ***Response to Arguments***

Applicant's arguments filed July 1, 2005 have been fully considered but they are not persuasive.

Applicant's argues that the instant invention teaches embossing of the substrate by mechanical alteration, thus the applied prior art fails to disclose the manufacturing method implied by the term "embossed" since it teaches etching the substrate to obtain the holes of the substrate. However, the Examiner notes that in spite of the fact that a product claim may recite only process limitations, it is the product and not the recited process that is covered by the

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claim. Furthermore, patentability of a claim to a product does not rest merely on the difference in the method by which the product is made. Rather, is the product itself which must be new and not obvious. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process. *In re Thorpe*, 777 F.2d 695, 698, 227 USPQ 964, 966 (Fed. Cir. 1985).

Accordingly, the structure implied by the process steps would be considered for assessing the patentability of product-by-process claims over the prior art (see MPEP 2113). Furthermore, it is considered that applicant has failed to provide sufficient evidence that the manufacturing process of the product as claimed imparts distinctive structural characteristics, therefore providing a different and unobvious product. As such, the rejection as stated above is deemed proper.

### ***Conclusion***

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

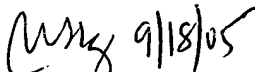
A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

**Contact Information**

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Mariceli Santiago whose telephone number is (571) 272-2464. The examiner can normally be reached on Monday-Friday from 9:30 AM to 6:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nimesh Patel, can be reached on (571) 272-2457. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

  
Mariceli Santiago  
Primary Examiner  
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